

# QUANTITATIVE ASSESSMENT OF WATER RESOURCES IN SANKURU RIVER BASIN, DR CONGO

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## INTRODUCTION

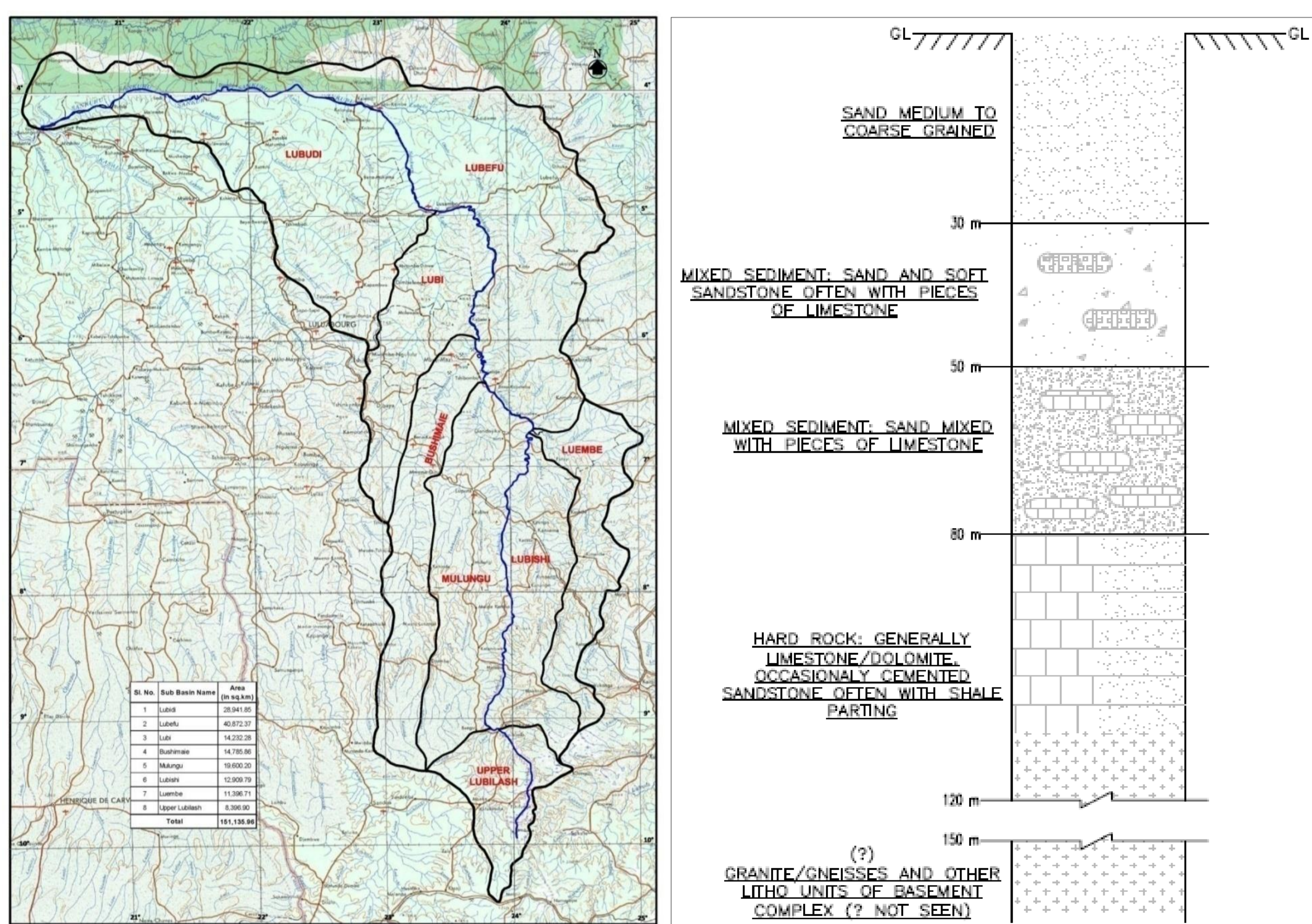
The Democratic Republic of the Congo (DRC) is a country with vast natural resources. The country abounds in agricultural and mineral resources and has the potential to be one of the richest countries in the African continent and a driver for African growth. The Congo River which flows from south-eastern part of the country to northern part along with its tributaries makes large fertile basin all along the country boundaries. Beneath such a fertile soil there lies an abundant deposit of minerals such as copper, niobium, tantalum, industrial and gem diamonds, gold, silver, zinc, manganese, tin, uranium, coal as well as petrol and timber.

## SANKURU RIVER BASIN

Sankuru River Basin lies in the south-west region of DR Congo having total catchment area of 1,51,136 km<sup>2</sup>. Sankuru River is a major river of the Basin having a length of about 1,200 km which makes it the longest tributary of Kasai River which itself is a tributary of Congo River located in Central Africa. Sankuru River Basin is divided into eight sub-basins namely Lubudi, Lubefu, Lubi, Bushimaie, Mulungu, Luembe, Lubishi and Upper Lubilash.

Topography of the Basin area shows that in the upper reaches, Sankuru river flows through a deep valley, while it gets wider in the lower reaches. In the absence of geological map for the Sankuru River Basin, an attempt has been made to work out geological framework giving general disposition of various rock types with their probable geological age. The entire Sankuru River Basin is characterized by predominance of lateritic or limonitic sandy loam formations of Quaternary era except topographic intersections at places, it is persistent throughout the area.

Description of Sankuru River Basin



## WATER AVAILABILITY

### SURFACE WATER AVAILABILITY

Due to non-availability of observed discharge data in different sub-catchments of Sankuru River Basin, the water availability for the present study has been assessed by computing average annual runoff based upon the rainfall data and runoff coefficients for each sub-catchments.

Estimation of Annual Surface water availability in Sub-basin areas

S. No.	Sub-Catchment	Catchment area (sq. km)	Annual Rainfall (mm/annum)	Total Precipitation (P) (BCM)	Runoff coefficient (K)	Average runoff computed (Q = KxP) (BCM)
1	Lubudi	28,941.85	1643	47.55	0.20	9.51
2	Lubefu	40,872.37	1550	63.35	0.20	12.67
3	Lubi	14,232.28	1648	23.45	0.22	5.16
4	Bushimaie	14,785.86	1529	22.60	0.26	5.88
5	Mulungu	19,600.20	1642	32.18	0.28	9.01
6	Lubishi	12909.79	1480	19.11	0.28	5.35
7	Luembe	11396.71	1415	16.13	0.28	4.52
8	Upper Lubilash	8,396.90	1425	11.96	0.28	3.35
	<b>Total</b>	<b>151135.96</b>	<b>1542</b>	<b>236.33</b>		<b>55.45</b>

Quantitative assessment of the ground water resources of Sankuru river basin by applying 'Infiltration Method'. In general the infiltration factor for loose medium grained sand is 20% and that of laterite 7%. Considering that permeability of the sandy loam formation is reduced due to laterisation/ limonitisation, the infiltration factor for the formation has been adopted as 14%.

Estimation of Annual Replishable Ground water availability in Sub-basin areas

S. No.	Sub-Catchment	Catchment area (sq. km)	Annual Rainfall (mm/annum)	Total Precipitation (P) (BCM)	Infiltration coefficient (i)	Average annual runoff computed (Q = ixP) (BCM)
1	Lubudi	28,941.85	1643	47.55	0.14	6.65
2	Lubefu	40,872.37	1550	63.35	0.14	8.86
3	Lubi	14,232.28	1648	23.45	0.14	3.28
4	Bushimaie	14,785.86	1529	22.60	0.14	3.16
5	Mulungu	19,600.20	1642	32.18	0.14	4.51
6	Lubishi	12909.79	1480	19.11	0.14	2.67
7	Luembe	11396.71	1415	16.13	0.14	2.26
8	Upper Lubilash	8,396.90	1425	11.96	0.14	1.67
	<b>Total</b>	<b>151135.96</b>	<b>1542</b>	<b>236.33</b>		<b>33.06</b>

## RESULT AND DISCUSSION

Water demand in the Basin area has been calculated for the year 2030 for various uses in different sector assuming the growth rate of 2.65 % for the period 2010-2015 and gradually reducing it to 2.03% for the period 2025-2030.

It would be observed from the above that in Sankuru Basin water availability is much more than the demand for various sectors. Against the total availability of 88.51 BCM (surface water 55.45 BCM and Ground water potential 33.06 BCM) the demand is only about 2.6 BCM for year 2030.

## RECOMMENDATIONS

In absence of modern chemical laboratory properly equipped to carry out routine analysis for ascertaining general hydro chemical profile of the ground water/surface water with the determination of important chemical constituents viz pH, Electrical conductivity (EC), hardness as total CaCO<sub>3</sub> Nitrate (NO<sub>3</sub>), Chloride (Cl), Sulphate (SO<sub>4</sub>), Fluoride (F), Iron (Fe) etc, there are no functional monitoring to know the water quality status.

Ground water resources are also much under exploited and the area holds promise for development of ground water resources through construction of various drawal structures viz, hand pumps, shallow and deep tubewells, dugwell, dug cum bore wells etc. A beginning can be made by planning and executing ground water based water supply schemes for rural, peri urban and urban areas for the benefit of the local community.

Estimated Water Demand in year 2030 for Various sectors

S. No.	Sectors	Water Demand (BCM)
1.	Domestic (Urban and Rural)	0.472
2.	Agriculture and Irrigation	1.786
3.	Livestock	0.175
4.	Pisciculture	0.086
5.	Mining and Industries, Hydropower, Environment and Ecology and Navigation	Nil (Being negligible requirement) at present
	<b>Total</b>	<b>2.599</b>